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SOLAR/1012-79/02

Monthly Performance Report

J. D. EVANS

HOUSE A

FEBRUARY 1979

U.S. Department of Energy

National Solar Heating and Cooling Demonstration Program

National Solar Data Program

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MONTHLY PERFORMANCE REPORT

J. D. EVANS, INC.
HOUSE A

FEBRUARY 1979

I. SYSTEM DESCRIPTION

J. D. Evans, House A is one of two instrumented single-family residences in Columbia, Maryland. The home has approximately 2250 square feet of conditioned space. Solar energy is used for space heating the home and preheating domestic hot water (DHW). The solar energy system has an array of flat-plate collectors with a gross area of 350 square feet. The array faces south at an angle of 45 degrees to the horizontal. Water is the transfer medium that delivers solar energy from the collector array to storage and to the space heating and hot water loads. Solar energy is stored in the basement in a 1000-gallon steel storage tank. Incoming city water is preheated in a liquid-to-liquid heat exchanger located in the storage tank and then flows into a conventional 40-gallon DHW tank. When solar energy is insufficient to satisfy the space heating load, a heat exchanger within a heat pump and an electrical heating element in the air-distribution duct provides auxiliary energy for space heating. Similarly, an electrical heating element in the DHW tank provides auxiliary energy for water heating. The system, shown schematically in Figure 1, has three modes of solar operation.

Mode 1 - Collector-to-Storage: This mode activates when the temperature difference between the storage tank and the collector outlet is higher than 15°F. Water circulates from the storage tank through the collector until a temperature difference of less than 5°F is reached.

Mode 2 - Storage-to-Space Heating: This mode activates when thermal energy for space heating is requested by the room thermostat. Solar-heated water from storage circulates through a liquid-to-air heat exchanger in the space heating air duct. If solar energy is insufficient to satisfy the space heating load, the heat pump and/or the auxiliary electrical heating element will be activated. The electrical strip heater can also be manually operated without solar heating and heat pump operation.

Mode 3 - DHW Preheating: This mode is activated by drawing hot water from the system. Cold supply water is preheated in a liquid-to-liquid heat exchanger located in the solar energy storage tank before flowing to the DHW tank. If the required DHW tank temperature is not maintained by solar preheating, auxiliary energy is provided by the electrical heating element in the DHW tank.

II. PERFORMANCE EVALUATION

INTRODUCTION

The site was occupied in February and the solar energy system operated continuously during the month. Solar energy satisfied 19 percent of the DHW requirements

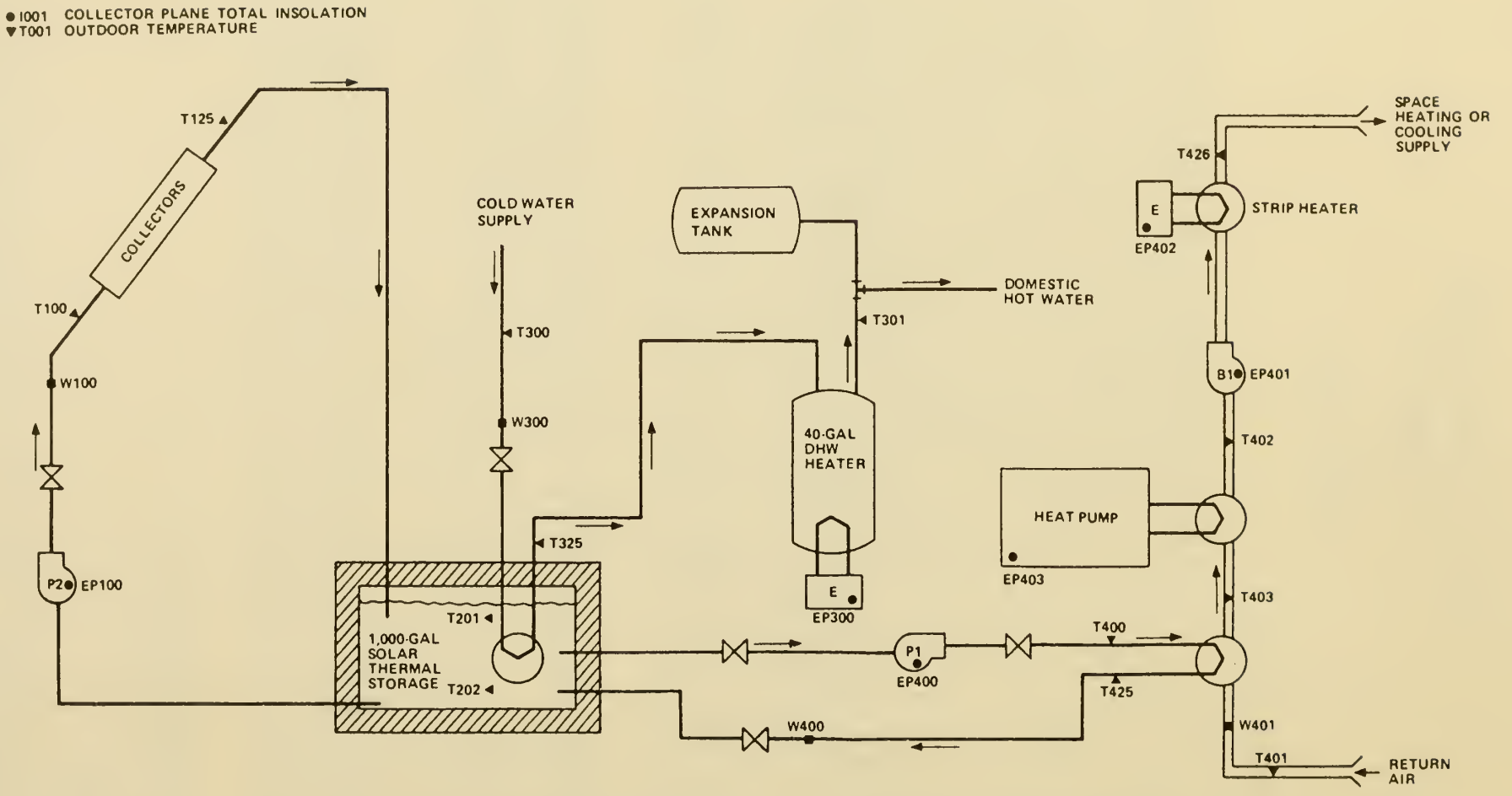

Figure 1. J. D. EVANS, INC., HOUSE A SOLAR ENERGY SYSTEM SCHEMATIC

and 7 percent of the space heating requirements. The solar energy system provided electrical savings of 0.8 million Btu. No data was collected during the first 13 days of the month. The Site Data Acquisition Subsystem (SDAS) was repaired and put back into operation on February 13.

WEATHER CONDITIONS

During the month, total incident solar energy on the collector array was 9.1 million Btu for a daily average of 925 Btu per square foot. This was below the estimated average daily solar radiation for this geographical area during February of 1205 Btu per square foot for a south-facing plane with a tilt of 45 degrees to the horizontal. The average ambient temperature during February was 26°F as compared with the long-term average for February of 35°F.

THERMAL PERFORMANCE

Collector - The total incident solar radiation on the collector array for the month of February was 9.1 million Btu. During the period the collector loop was operating the total insolation amounted to 6.6 million Btu. The total collected solar energy for the month of February was 2.5 million Btu, resulting in a collector array efficiency of 27 percent, based on total incident insolation. Solar energy delivered from the collector array to storage was 2.5 million Btu. Operating energy required by the collector loop was 0.11 million Btu.

Storage - Solar energy delivered to storage was 2.5 million Btu. There were 1.3 million Btu delivered from storage to the DHW and space heating subsystems. Energy loss from storage was 0.76 million Btu. This loss represented 31 percent of the energy delivered to storage. The storage efficiency was 69 percent: This is calculated as the ratio of the sum of the energy removed from storage and the change in stored energy, to the energy delivered to storage. The average storage temperature for the month was 87°F.

DHW Load - The DHW subsystem consumed 0.14 million Btu of solar energy and 0.64 million Btu of auxiliary electrical energy to satisfy a hot water load of 0.61 million Btu. The solar fraction of this load was 19 percent. Losses from the DHW subsystem were 0.17 million Btu. The DHW subsystem consumed no operating energy, resulting in an electrical energy savings of 0.14 million Btu. A daily average of 26 gallons of DHW was consumed at an average temperature of 142°F delivered from the tank.

Space Heating Load - The space heating subsystem consumed 1.1 million Btu of solar energy and 7.7 million Btu of auxiliary electrical energy to satisfy a space heating load of 15.8 million Btu. The heat pump supplied a load of 14.7 million Btu. The solar fraction of the space heating load was 7 percent. The space heating subsystem consumed a total of 0.95 million Btu of operating energy, resulting in an electrical energy savings of 0.77 million Btu. The average ambient temperature inside the house was 68°F.

OBSERVATIONS

There was no data collected during the first 13 days of the month. The SDAS was repaired and put back into operation on February 13. Data was collected and processed from February 13 to the end of the month.

The net loss of collected solar energy on February 13 was caused by the forced system operation at low incident radiation for systems test.

ENERGY SAVINGS

The solar energy system provided a net electrical energy savings of 0.8 million Btu. The DHW subsystem provided an electrical energy savings of 0.14 million Btu, while the space heating subsystem contributed an electrical energy savings of 0.8 million Btu.

III. ACTION STATUS

No action is required at this time.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SITE SUMMARY

SITE: J.D. EVANS,INC. HOUSE A, COLUMBIA, MARYLAND SOLAR/1012-79/02
REPORT PERIOD: FEBRUARY,1979

SITE/SYSTEM DESCRIPTION:
THE INSTALLATION CONSISTS OF TWO ADJACENT BUT SEPARATE RESIDENCES USING A SINGLE J-BOX AND SDAS. THE TWO HOUSES HAVE IDENTICAL AND INDEPENDENT SOLAR ASSISTED SYSTEMS. A LIQUID COLLECTOR TRANSFERS SOLAR HEAT TO A 1000 GALLON STORAGE TANK. A HEAT EXCHANGER IN THE STORAGE TANK PREHEATS DOMESTIC HOT WATER. STORAGE WATER IS CIRCULATED TO AN INDUCTIVE HEAT EXCHANGER FOR SPACE HEATING. RESISTANCE HEATING AND A HEAT PUMP, WHICH SUPPLIES SOME HEAT AND ALL COOLING, COMPLETE THE SYSTEM. ALL AUXILIARY ENERGY USED IS ELECTRIC.

GENERAL SITE DATA:

INCIDENT SOLAR ENERGY	9.067	MILLION BTU
	25906	BTU/SQ.FT.
COLLECTED SOLAR ENERGY	2.459	MILLION BTU
	7025	BTU/SQ.FT.
AVERAGE AMBIENT TEMPERATURE	26	DEGREES F
AVERAGE BUILDING TEMPERATURE	68	DEGREES F
ECSS SOLAR CONVERSION EFFICIENCY	0.14	
ECSS OPERATING ENERGY	0.106	MILLION BTU
TOTAL SYSTEM OPERATING ENERGY	1.042	MILLION BTU
TOTAL ENERGY CONSUMED	11.348	MILLION BTU

SUBSYSTEM SUMMARY:

	HOT WATER	HEATING	COOLING	SYSTEM TOTAL	
LOAD	0.612	15.803	N.A.	16.415	MILLION BTU
SOLAR FRACTION	19	7	N.A.	8	PERCENT
SOLAR ENERGY USED	0.142	1.127	N.A.	1.269	MILLION BTU
OPERATING ENERGY	N.A.	0.951	N.A.	1.042	MILLION BTU
AUX. THERMAL ENERGY	0.640	5.398	N.A.	6.039	MILLION BTU
AUX. ELECTRIC FUEL	0.640	7.712	N.A.	8.352	MILLION BTU
AUX. FOSSIL FUEL	N.A.	N.A.	N.A.	N.A.	MILLION BTU
ELECTRICAL SAVINGS	0.142	0.768	N.A.	0.804	MILLION BTU
FOSSIL SAVINGS	N.A.	N.A.	N.A.	N.A.	MILLION BTU

SYSTEM PERFORMANCE FACTOR: 0.525

* DENOTES UNAVAILABLE DATA
@ DENOTES NULL DATA
N.A. DENOTES NOT APPLICABLE DATA

REFERENCE: USER'S GUIDE TO THE MONTHLY PERFORMANCE REPORT OF THE NATIONAL SOLAR DATA PROGRAM,FEBRUARY 28,1978, SOLAR/0004-78/18

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SITE SUMMARY

SITE: J.D. EVANS,INC. HOUSE A, COLUMBIA, MARYLAND SOLAR/1012-79/02
REPORT PERIOD: FEBRUARY,1979

SITE/SYSTEM DESCRIPTION:
THE INSTALLATION CONSISTS OF TWO ADJACENT BUT SEPARATE RESIDENCES USING A SINGLE J-BOX AND SDAS. THE TWO HOUSES HAVE IDENTICAL AND INDEPENDENT SOLAR ASSISTED SYSTEMS. A LIQUID COLLECTOR TRANSFERS SOLAR HEAT TO A 1000 GALLON STORAGE TANK. A HEAT EXCHANGER IN THE STORAGE TANK PREHEATS DOMESTIC HOT WATER. STORAGE WATER IS CIRCULATED TO AN INDUCTIVE HEAT EXCHANGER FOR SPACE HEATING. RESISTANCE HEATING AND A HEAT PUMP, WHICH SUPPLIES SOME HEAT AND ALL COOLING, COMPLETE THE SYSTEM. ALL AUXILIARY ENERGY USED IS ELECTRIC.

GENERAL SITE DATA:

INCIDENT SOLAR ENERGY	9.566	GIGA JOULES
	294184	KJ/SQ.M.
COLLECTED SOLAR ENERGY	2.594	GIGA JOULES
	79779	KJ/SQ.M.
AVERAGE AMBIENT TEMPERATURE	-3	DEGREES C
AVERAGE BUILDING TEMPERATURE	20	DEGREES C
ECSS SOLAR CONVERSION EFFICIENCY	0.14	
ECSS OPERATING ENERGY	0.112	GIGA JOULES
TOTAL SYSTEM OPERATING ENERGY	1.100	GIGA JOULES
TOTAL ENERGY CONSUMED	11.972	GIGA JOULES

SUBSYSTEM SUMMARY:

	HOT WATER	HEATING	COOLING	SYSTEM TOTAL	
LOAD	0.646	16.672	N.A.	17.318	GIGA JOULES
SOLAR FRACTION	19	7	N.A.	8	PERCENT
SOLAR ENERGY USED	0.150	1.190	N.A.	1.339	GIGA JOULES
OPERATING ENERGY	N.A.	1.004	N.A.	1.100	GIGA JOULES
AUX. THERMAL ENG	0.676	5.695	N.A.	6.371	GIGA JOULES
AUX. ELECTRIC FUEL	0.676	8.136	N.A.	8.812	GIGA JOULES
AUX. FOSSIL FUEL	N.A.	N.A.	N.A.	N.A.	GIGA JOULES
ELECTRICAL SAVINGS	0.150	0.811	N.A.	0.848	GIGA JOULES
FOSSIL SAVINGS	N.A.	N.A.	N.A.	N.A.	GIGA JOULES

SYSTEM PERFORMANCE FACTOR: 0.525

* DENOTES UNAVAILABLE DATA
@ DENOTES NULL DATA
N.A. DENOTES NOT APPLICABLE DATA

REFERENCE: USER'S GUIDE TO THE MONTHLY PERFORMANCE REPORT OF THE NATIONAL SOLAR DATA PROGRAM,FEBRUARY 28,1978, SOLAR/0004-78/18

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
ENERGY COLLECTION AND STORAGE SUBSYSTEM (ECSS)

SITE: J.D. EVANS,INC. HOUSE A, COLUMBIA, MARYLAND SOLAR/1012-79/02
REPORT PERIOD: FEBRUARY,1979

DAY OF MONTH	INCIDENT SOLAR ENERGY MILLION BTU	AMBIENT TEMP DEG-F	ENERGY TO LOADS MILLION BTU	AUX THERMAL TO ECSS MILLION BTU	ECSS OPERATING ENERGY MILLION BTU	ECSS ENERGY REJECTED MILLION BTU	ECSS SOLAR CONVERSION EFFICIENCY
1	*	*	NOT APPLICABLE	NOT APPLICABLE	*	NOT APPLICABLE	*
2	*	*			*		*
3	*	*			*		*
4	*	*			*		*
5	*	*			*		*
6	*	*			*		*
7	*	*			*		*
8	*	*			*		*
9	*	*			*		*
10	*	*			*		*
11	*	*			*		*
12	*	*			*		*
13	0.138	12			0.001		0.010
14	0.395	11			0.006		0.121
15	0.056	17			0.000		0.134
16	0.141	23			0.002		0.015
17	0.883	7			0.010		0.116
18	0.093	6			0.000		0.914
19	0.619	22			0.005		0.109
20	0.673	23			0.009		0.114
21	0.070	32			0.000		1.107
22	0.677	40			0.011		0.066
23	0.098	35			0.000		1.100
24	0.073	39			0.000		0.059
25	0.051	39			0.000		0.196
26	0.037	36			0.000		0.053
27	0.425	36			0.007		0.081
28	0.750	40			0.011		0.071
SUM	9.067	-	N.A.	N.A.	0.106	N.A.	-
AVG	0.324	26	N.A.	N.A.	0.004	N.A.	0.140
NBS ID	Q001	N113			Q102		N111

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENCTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
COLLECTOR ARRAY PERFORMANCE

SITE: J.D. EVANS,INC. HOUSE A, COLUMBIA, MARYLAND SOLAR/1012-79/02
REPORT PERIOD: FEBRUARY,1979

DAY OF MONTH	INCIDENT SOLAR ENERGY MILLION BTU	OPERATIONAL INCIDENT ENERGY MILLION BTU	COLLECTED SOLAR ENERGY MILLION BTU	DAYTIME AMBIENT TEMP DEG F	COLLECTOR ARRAY EFFICIENCY
1	*	*	*	*	*
2	*	*	*	*	*
3	*	*	*	*	*
4	*	*	*	*	*
5	*	*	*	*	*
6	*	*	*	*	*
7	*	*	*	*	*
8	*	*	*	*	*
9	*	*	*	*	*
10	*	*	*	*	*
11	*	*	*	*	*
12	*	*	*	*	*
13	0.138	0.016	-0.002	16	-0.017
14	0.395	0.315	0.104	18	0.262
15	0.056	0.000	0.000	19	0.000
16	0.141	0.034	0.003	28	0.019
17	0.883	0.779	0.264	11	0.298
18	0.093	0.000	0.000	8	0.000
19	0.619	0.355	0.141	28	0.228
20	0.673	0.581	0.219	34	0.325
21	0.070	0.000	0.000	36	0.000
22	0.677	0.636	0.259	48	0.383
23	0.098	0.000	0.000	38	0.000
24	0.073	0.000	0.000	39	0.000
25	0.051	0.000	0.000	41	0.000
26	0.037	0.000	0.000	37	0.000
27	0.425	0.341	0.106	38	0.249
28	0.750	0.730	0.312	*	0.417
SUM	9.067	6.627	2.459	-	-
AVG	0.324	0.237	0.088	29	0.271
NBSID	0001		0100		N100

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
STORAGE PERFORMANCE

SITE: J.D. EVANS,INC. HOUSE A, COLUMBIA, MARYLAND SOLAR/1012-79/02
REPORT PERIOD: FEBRUARY,1979

DAY OF MONTH	ENERGY TO STORAGE MILLION BTU	ENERGY FROM STORAGE MILLION BTU	CHANGE IN STORED ENERGY MILLION BTU	STORAGE AVERAGE TEMP DEG F	STORAGE EFFICIENCY
1	*	*	*	*	*
2	*	*	*	*	*
3	*	*	*	*	*
4	*	*	*	*	*
5	*	*	*	*	*
6	*	*	*	*	*
7	*	*	*	*	*
8	*	*	*	*	*
9	*	*	*	*	*
10	*	*	*	*	*
11	*	*	*	*	*
12	*	*	*	*	*
13	-0.002	0.001	0.002	81	-1.222
14	0.104	0.048	0.020	87	0.649
15	0.000	0.008	-0.017	82	1.000
16	0.003	0.002	0.001	82	1.111
17	0.264	0.102	0.117	96	0.831
18	0.000	0.085	-0.129	84	1.000
19	0.141	0.068	0.035	85	0.730
20	0.219	0.077	0.097	94	0.795
21	0.000	0.078	-0.118	85	1.000
22	0.259	0.045	0.193	97	0.915
23	0.000	0.108	-0.183	92	1.000
24	0.000	0.004	-0.008	83	1.000
25	0.000	0.010	-0.011	82	1.000
26	0.000	0.002	-0.004	81	1.000
27	0.106	0.034	0.041	87	0.715
28	0.312	0.053	0.208	101	0.836
SUM	2.459	1.269	0.426	-	-
AVG	0.088	0.045	0.015	87	0.689
NBS ID	Q200	Q201	Q202		N108

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
HOT WATER SUBSYSTEM

SITE: J.D. EVANS,INC. HOUSE A, COLUMBIA, MARYLAND
REPORT PERIOD: FEBRUARY,1979

SOLAR/1012-79/02

DAY OF MON.	HOT WATER LOAD MILLION BTU	SOLAR FR.OF LOAD PER CENT	SOLAR ENERGY USED MILLION BTU	OPER ENERGY MILLION BTU	AUX THERMAL USED MILLION BTU	AUX ELECT FUEL MILLION BTU	AUX FOSSIL FUEL MILLION BTU	ELECT ENERGY SAVINGS MILLION BTU	FOSSIL ENERGY SAVINGS MILLION BTU	SUP. WAT. TEMP DEG F	HOT WAT. TEMP DEG F	HOT WATER USED GAL
1	*	*	*	NOT APPLICABLE	*	*	NOT APPLICABLE	*	NOT APPLICABLE	*	*	*
2	*	*	*		*	*		*		*	*	*
3	*	*	*		*	*		*		*	*	*
4	*	*	*		*	*		*		*	*	*
5	*	*	*		*	*		*		*	*	*
6	*	*	*		*	*		*		*	*	*
7	*	*	*		*	*		*		*	*	*
8	*	*	*		*	*		*		*	*	*
9	*	*	*		*	*		*		*	*	*
10	*	*	*		*	*		*		*	*	*
11	*	*	*		*	*		*		*	*	*
12	*	*	*		*	*		*		*	*	*
13	0.008	8	0.001		0.012	0.012		0.001		50	143	10
14	0.012	9	0.002		0.016	0.016		0.002		46	141	15
15	0.006	10	0.001		0.010	0.010		0.001		57	143	8
16	0.013	11	0.002		0.018	0.018		0.002		53	142	16
17	0.013	23	0.007		0.011	0.011		0.007		55	141	16
18	0.071	22	0.015		0.057	0.057		0.015		48	143	84
19	0.069	21	0.015		0.064	0.064		0.015		47	143	81
20	0.035	27	0.011		0.030	0.030		0.011		49	143	42
21	0.022	21	0.005		0.022	0.022		0.005		48	143	26
22	0.007	18	0.001		0.016	0.016		0.001		44	142	9
23	0.007	19	0.002		0.011	0.011		0.002		46	142	9
24	0.019	18	0.004		0.022	0.022		0.004		53	142	22
25	0.048	18	0.010		0.041	0.041		0.010		44	144	56
26	0.011	19	0.002		0.014	0.014		0.002		46	143	13
27	0.000	13	0.000		0.010	0.010		0.000		43	140	0
28	0.009	12	0.002		0.013	0.013		0.002		44	140	11
SUM	0.612	-	0.142	N.A.	0.640	0.640	N.A.	0.142	N.A.	-	-	727
AVG	0.022	19	0.005	N.A.	0.023	0.023	N.A.	0.005	N.A.	48	142	26
NBS	Q302	N300	Q300	Q303	Q301	Q305	Q306	Q311	Q313	N305	N307	N308

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SPACE HEATING SUBSYSTEM

SITE: J.D. EVANS,INC. HOUSE A, COLUMBIA, MARYLAND SOLAR/1012-79/02
REPORT PERIOD: FEBRUARY,1979

DAY OF MON.	SPACE HEATING LOAD MILLION BTU	SOLAR FR.OF LOAD PCT	SOLAR ENERGY USED MILLION BTU	OPER ENERGY MILLION BTU	AUX THERMAL USED MILLION BTU	AUX ELECT FUEL MILLION BTU	AUX FOSSIL FUEL MILLION BTU	ELECT ENERGY SAVINGS MILLION BTU	FOSSIL ENERGY SAVINGS MILLION BTU	BLDG TEMP DEG. F	AMB TEMP DEG. F
1	*	*	*	*	*	*	NOT APPLICABLE	*	NOT APPLICABLE	*	*
2	*	*	*	*	*	*		*		*	*
3	*	*	*	*	*	*		*		*	*
4	*	*	*	*	*	*		*		*	*
5	*	*	*	*	*	*		*		*	*
6	*	*	*	*	*	*		*		*	*
7	*	*	*	*	*	*		*		*	*
8	*	*	*	*	*	*		*		*	*
9	*	*	*	*	*	*		*		*	*
10	*	*	*	*	*	*		*		*	*
11	*	*	*	*	*	*		*		*	*
12	*	*	*	*	*	*		*		*	*
13	0.766	0	0.000	0.048	0.323	0.462		0.000		67	12
14	0.642	7	0.046	0.049	0.256	0.366		0.035		68	11
15	0.860	1	0.006	0.047	0.329	0.470		0.005		67	17
16	0.876	0	0.000	0.043	0.314	0.449		0.000		68	23
17	0.658	14	0.095	0.049	0.251	0.359		0.086		67	7
18	0.568	12	0.070	0.050	0.224	0.321		0.065		67	6
19	0.659	8	0.053	0.043	0.223	0.319		0.035		67	22
20	0.528	12	0.066	0.035	0.176	0.252		0.047		67	23
21	0.482	15	0.073	0.031	0.129	0.185		0.047		68	32
22	0.301	14	0.044	0.018	0.081	0.115		0.023		67	40
23	0.300	35	0.106	0.027	0.060	0.086		0.054		69	35
24	0.459	0	0.000	0.017	0.141	0.201		0.000		68	39
25	0.479	0	0.000	0.018	0.147	0.209		0.000		68	39
26	0.614	0	0.000	0.023	0.193	0.276		0.000		68	36
27	0.527	7	0.034	0.028	0.155	0.222		0.016		68	36
28	0.312	17	0.052	0.018	0.082	0.117		0.025		67	40
SUM	15.803	-	1.127	0.951	5.398	7.712	N.A.	0.768	N.A.	-	-
AVG	0.564	7	0.040	0.034	0.193	0.275	N.A.	0.027	N.A.	68	26
NBS	Q402	N400	Q400	Q403	Q401		Q410	Q415	Q417	N406	N113

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
ENVIRONMENTAL SUMMARY

SITE: J.D. EVANS,INC. HOUSE A, COLUMBIA, MARYLAND SOLAR/1012-79/02
REPORT PERIOD: FEBRUARY,1979

DAY OF MONTH	TOTAL INSOLATION BTU/SQ.FT	DIFFUSE INSOLATION BTU/SQ.FT	AMBIENT TEMPERATURE DEG F	DAYTIME AMBIENT TEMP DEG F	RELATIVE HUMIDITY PERCENT	WIND DIRECTION DEGREES	WIND SPEED M.P.H.
1	*	N	*	*	N	N	N
2	*	O	*	*	O	O	O
3	*	T	*	*	T	T	T
4	*		*	*			
5	*	A	*	*	A	A	A
6	*	P	*	*	P	P	P
7	*	P	*	*	P	P	P
8	*	L	*	*	L	L	L
9	*	I	*	*	I	I	I
10	*	C	*	*	C	C	C
11	*	A	*	*	A	A	A
12	*	B	*	*	B	B	B
13	395	L	12	16	L	L	L
14	1127	E	11	18	E	E	E
15	160		17	19			
16	403		23	28			
17	2524		7	11			
18	267		6	8			
19	1770		22	28			
20	1923		23	34			
21	201		32	36			
22	1935		40	48			
23	281		35	38			
24	210		39	39			
25	145		39	41			
26	106		36	37			
27	1214		36	38			
28	2143		40	*			
SUM	25906	N.A.	-	-	-	-	-
AVG	925	N.A.	26	29	N.A.	N.A.	N.A.
NBS ID	Q001		N113			N115	N114

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N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
THERMODYNAMIC CONVERSION EQUIPMENT

SITE: J.D. EVANS,INC. HOUSE A, COLUMBIA, MARYLAND SOLAR/1012-79/02
REPORT PERIOD: FEBRUARY,1979

DAY OF MONTH	EQUIPMENT LOAD MILLION BTU	THERMAL ENERGY INPUT MILLION BTU	OPERATING ENERGY MILLION BTU	ENERGY REJECTED MILLION BTU	COEFFICIENT OF PERFORMANCE (SEE NOTE)
1	*	*	NOT APPLICABLE	NOT APPLICABLE	*
2	*	*			*
3	*	*			*
4	*	*			*
5	*	*			*
6	*	*			*
7	*	*			*
8	*	*			*
9	*	*			*
10	*	*			*
11	*	*			*
12	*	*			*
13	0.766	0.462			0.000
14	0.597	0.366			0.000
15	0.854	0.470			0.000
16	0.876	0.449			0.000
17	0.563	0.359			0.000
18	0.497	0.321			0.000
19	0.606	0.319			0.000
20	0.462	0.252			0.000
21	0.409	0.185			0.000
22	0.257	0.115			0.000
23	0.194	0.086			0.000
24	0.459	0.201			0.000
25	0.479	0.209			0.000
26	0.614	0.276			0.000
27	0.492	0.222			0.000
28	0.260	0.117			0.000
SUM	14.675	7.712	*	*	0.000
AVG	0.524	0.275	*	*	0.000

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NOTE:

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